Section 8.3 – 8.4: Factoring Using the AC Method
Guided Notes
Honors Algebra I

Name: _____

Date: _____

I can factor and solve equations using the AC Method.

Factoring Quadratics Using the AC Method

- The AC Method is a strategy used to factor *trinomials* (expressions with 3 terms).
- Think of the AC Method as a way of *undoing* the distributive property.
- We will be factoring quadratics of the form $Ax^2 + Bx + C$.

Steps	Example
	Solve $x^2 + 11x = -24$
Step 1: Move all terms to the same side. →	$x^2 + 11x + 24 = 0$
Step 2: List all the factors of $A \cdot C$ and their sums And find the pair of factors that **adds to B.** →	In this case, $A \cdot C = 1 \cdot 24 = 24$. Factors of 24 that add to 11 are **3** and **8**.
Step 3: *Split the middle* term into the factors that **add to B.** →	$x^2 + 3x + 8x + 24 = 0$
Step 4: Factor by grouping. →	$x(x + 3) + 8(x + 3) = 0$ $(x + 3)(x + 8) = 0$
Step 5: Set each factor equal to zero and solve (if it is an equation). →	$x + 3 = 0$ $\quad$ $x + 8 = 0$ $\boxed{x = -3}$ $\quad$ $\boxed{x = -8}$

Examples (factoring trinomials)

a) $x^2 + 9x + 20$

1 × 20
A · C

Factors of 20	Sum
20 and 1	21
10 and 2	12
5 and 4	9

$x^2 + 5x + 4x + 20$

$x(x + 5) + 4(x + 5)$

$(x + 4)(x + 5)$

b) $2x^2 + 5x + 3$

2 · 3
A · C

Factors of 6	Sum
6 and 1	7
3 and 2	5

$2x^2 + 3x + 2x + 3$

$x(2x + 3) + 1(2x + 3)$

$(x + 1)(2x + 3)$

or

$2x^2 + 2x + 3x + 3$

$2x(x + 1) + 3(x + 1)$

$(2x + 3)(x + 1)$

c) $x^2 + 2x - 15$

A·C

1 x -15 -15	Sum
-5 and 3	-2
-3 and 5	2
15 and -1	14
-15 and 1	-14

$x^2+5x-3x-15$

$x(x+5)-3(x+5)$

$(x-3)(x+5)$

d) $7x^2 + 29x + 4$

A·C
7·4

28	Sum
28 and 1	29
14 + 2	16
7 + 4	11

$7x^2+28x+x+4$

$7x(x+4)+1(x+4)$

$(7x+1)(x+4)$

e) $21 - 22m + m^2$

A·C
1·21

Factors of 21	Sum
21 + 1	22
7 + 3	11

$m^2-22m+21$

$m^2-21m-m+21$

$m(m-21)-1(m-21)$

$(m-1)(m-21)$

f) $3x^2 + 15x + 18$

A·C
3·18

Factors of 54	Sum
54 + 1	55
27 + 2	29
9 + 6	15
3 + 18	21

$3x^2+9x+6x+18$

$3x(x+3)+6(x+3)$

$(3x+6)(x+3)$

g) $x^2 + 15x + 56$

1·56

Factors of 56	Sum
56·1	57
2·28	30
4·14	18
8·7	15

$x^2+8x+7x+56$

$x(x+8)+7(x+8)$

$(x+7)(x+8)$

h) $3x^2 - 17x + 20$

3x20
60

Factors of 60	Sum
60 + 1	61
30 + 2	32
15 + 4	19
20 + 3	23
5 + 12	17

$3x^2+5x+12x+20$

$x(3x+5)+4(3x+5)$

$(x+4)(3x+5)$